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represented to the chief harbour-master that on account of the great crowd of shipping those lying towards the opposite shores could not see the time-ball, and begging that some means might be adopted to make the signal more generally seen, the harbour-master had an apparatus fitted to the inside of the lantern, which obscures the light by releasing one trigger, and shows it again suddenly by releasing another. This was his own arrangement, and my instructions were to obscure the light at 2 minutes to 8 P.M., and suddenly show it at 8 o'clock, the latter being the true signal, any error of which would be published in the daily papers. It answers very well, but is very inconvenient, climbing the lighthouse-tower with a chronometer in hand. The master-mariners think it a great convenience, as it allows them to attend to the rating of their chronometers themselves, for business often keeps them on shore during the day. If this is continued, I must get some better plan devised: the telegraph wires could be used here too.

"The sum of 2500*l.* was voted by the Legislative Council for the building a stone observatory at Williamstown; this has not been done yet, but the Governor has placed in the estimates for next year the sum of 660*l.* for the purchase of astronomical and meteorological instruments, according to a list of what would absolutely be required that I was instructed to send in. The chief of these instruments were,—a transit circle, by Troughton and Simms; a 5 or 6-feet equatoreal by Troughton and Simms, or Ross; a portable transit collimator, &c.; with a small equipment of good meteorological instruments. In the ultimate purchase of these instruments, perhaps you might give some advice, from your great experience in such matters. At all events, I shall take the liberty of informing you when the orders are sent home for these instruments, in case you might feel any interest in guiding the purchase of them. I had omitted to say, that since December last I have kept a regular journal of three-hourly meteorological observations,—at least, so far as my limited staff of instruments allowed me, having only a simple, but very good pediment barometer, Zambra's thermometer, and aneroid barometer. Having neither rain-guage, anemometer, or hygrometer, of course my observations are very limited; but, such as they are, they represent some interesting facts with regard to Australian meteorology.

"Observatory, Gellibrand's Point,
Williamstown, Victoria."

Account of the Steps recently taken by Her Majesty's Government for Promoting the Regular Observation of Meteorological Phenomena at Sea. By Capt. Robert Fitzroy, R.N.

"The importance of accumulating meteorological observations,

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and tabulating them methodically, for the purpose of future, rather than immediate investigation, having been urged by the Royal Society, while the practical benefits arising from such collections, even at the present time, were proved by the direct consequences of Maury's extensive labours, Her Majesty's Ministers agreed to establish an office under the Board of Trade for receiving and tabulating all such observations made at sea.

"It was considered that much information might be compiled with respect to currents, as well as winds, which might be made more generally known to those interested in the passages of ships across the ocean; and that the sooner such authentic compilations could be made generally available, the greater would be their value. It was, moreover, pronounced to be necessary that instruments of a reliable and understood nature should be alone employed; that they should be carefully tested and vigilantly guarded from accidental causes of error.

"To meet these objects, an estimate of probable expenses was submitted to Parliament, and the sums proposed were voted, namely, 2000*l.* for the Mercantile Marine and 1000*l.* for her Majesty's ships.

"Soon afterwards an officer was appointed to execute the duties of the Meteorological Office, to be subsequently assisted by a few subordinates; but some time elapsed before instruments of the peculiar kind deemed proper by a Committee of the Royal Society could be finished, and an office appropriated for the object in view. Now the preliminary arrangements are made, and the Meteorological Office of the Board of Trade is open at No. 2 Parliament Street.

"A certain number of selected ships of the Mercantile Marine, and all those of her Majesty employed in long or distant voyages, are, or soon will be, engaged in making exact observations with instruments supplied under the authority of the Board of Trade (duly tested and compared), and in registering the apparent results according to forms settled at the Brussels Conference of 1853, slightly modified, however, so as to suit present convenience.

"The estimates sanctioned by Parliament are sufficient to provide sixty merchant-ships and forty men-of-war with the necessary meteorological instruments (namely, barometers, thermometers, and hydrometers), in addition to the nautical instruments usual at sea; to pay office expenses and salaries (including allowances to agents at outports); and to provide the necessary registers. A captain in the navy is in charge of the office. Four subordinates are to assist him, and there are agents appointed at the principal ports to communicate personally with the owners, captains, and officers of ships.

"Liberally supplied by the United States Government, Maury's Sailing Directions and Charts are distributed gratis among those who undertake to record observations satisfactorily, and send them to the Board of Trade. Marks, expressive of distinction, are to be annexed to the names of approved contributors to meteorology

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in the Mercantile Navy List, and other encouragements are contemplated.

"Every exertion will be made at the office, not only to discuss and tabulate valuable observations, but to digest and render available, as soon as possible, such information as may tend immediately to the improvement of navigation.

"*February* 8, 1855."

On the Application of Photography to Astronomical Observations.

(*Letter from Sir John F. W. Herschel to Colonel Sabine.*)

"I consider it an object of very considerable importance to secure at some observatory, and indeed at more than one, in different localities, daily photographic representations of the sun, with a view to keep up a consecutive and perfectly faithful record of the history of the spots. So far as regards the general delineation of the whole disk, and the marking out on it, in reference to the parallel to the equinoctial passing through its centre, the places, sizes, and forms of the spots, there would need, I should imagine, no very powerful telescope,—quite the contrary; but it should be equatoreally mounted, and ought to have a clock motion in the parallel. The image to be impressed on the paper (or collodionized glass) should be formed not in the focus of the object-lens, but in that of the eye-lens, drawn out somewhat beyond the proper situation for distinct vision (and always to the same invariable distance to insure an equally magnified image on each day). By this arrangement, a considerably magnified image of the sun, *and also of any system of wires* in the focus of the object-glass, may be thrown upon the 'focussing-glass' of a camera-box adjusted to the eye-end of a telescope. By employing a system of spider-lines, parallel and perpendicular to the diurnal motion, and so disposed as to divide the field of vision into squares, say of 5′ in the side, the central one crossing the sun's centre (or rather as liable to no uncertainty, one of them being a tangent to its lower or upper limb), the place of each spot on the surface is, *ipso facto*, mapped down in reference to the parallel and declination circle, and its distance from the border, and its size measurable on a fixed scale.

"If large spots are to be photographed specially with a view to the delineation of their forms and changes, a pretty large object-glass will be required, and the whole affair will become a matter of much greater nicety; but for reading the daily history of the sun, I should imagine a 3-inch object-glass would be ample.

"The representations should, if possible, be taken daily, and the time carefully noted. As far as possible, they should be taken at the same hour each day; but in this climate, a clear interval, occurring when it may, had better be secured early in the day.

"Three or four observations in tropical climates, distant se-